**ProgSD Team Project Specification 2023**

**E-Vehicle Share System**

**Objective**

Your task is to create a software system to support an electric vehicle share programme. You need to create a functioning end-to-end prototype and demonstrate it with appropriate data. Your product is meant to provide an interface for customers to reserve and return vehicles and to pay their bills; for operators to assess the state of the vehicles in the system and make changes; and for managers to view usage reports.

You must use **Python** for your implementation, with a user interface written in **Tkinter**. Your system must include a **database** to store the details of the vehicles, charging points, city locations, customers, and any other data as needed by your implementation. You must include at least **two vehicle types**, for example electric scooters and electric bikes; you can also include more vehicle types if you want to.

The detailed functionality of the system is up to you, but it should include at least the following capabilities:

* Customers should be able to:
  + **Rent** a vehicle at any location in the city, as long as there is a working vehicle available at that location.
  + **Return** a vehicle to any location. When a customer returns a vehicle, their account is **charged** depending on how long the vehicle rental was and what type of vehicle was used.
  + **Report a vehicle** as defective.
  + **Pay** any charges on their account.
* Operators should be able to:
  + **Track** the location of all vehicles in the city.
  + **Charge** a vehicle when the battery is depleted.
  + **Repair** a defective vehicle.
  + **Move vehicles** to different locations around the city as needed.
* Managers should be able to:
  + **Generate reports** showing all vehicle activities over a defined time period, using appropriate **data visualisation** techniques.

You may want to consult similar real-world systems such as Lime (<https://li.me/>) or Voi (<https://www.voiscooters.com/>) to help with your system design. **Note that it is not expected that you exactly duplicate the functionality of these systems**.

**What to submit**

Each group must submit the following (through Moodle):

* A **report** describing the functionality that was implemented, explaining any design decisions that were made. The report should also include a summary of how each team member contributed to the design and implementation, as well as to the report. Templates will be provided on Moodle.
* A **video presentation** of your system, up to **10 minutes long.**
  + All members of the team must speak on the video (cameras not required)
  + The video must include a live demo of all the system, as well as a discussion of all design decisions.
* All of the **source code** involved in the system, along with any other resources required to run it. You should also include a README file describing **exactly** how to run your software.